

**ABSTRACT**

**[0026]** A bipolar transistor-based linearizer with programmable gain and phase response apparatus uses a splitter to separate an incoming RF signal into two equal components: in-phase (I) and quadrature (Q, ninety degrees delayed). The I signal then passes through a first bipolar variable gain amplifier (VGA) while the Q signal passes through a second bipolar VGA. After passing through the first and second VGAs, the amplified signals are combined at the output using a summer to produce a predistorted signal that drives a TWTA. The gains of each VGA are controlled using an RF power detector in conjunction with a bipolar gain/phase slope controller. Each gain can be adjusted separately to product a large range of linearization characteristics.